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ABSTRACT

The Associated Colleges of the Midwest Periodical Bank is a service which provides interlibrary access to periodical literature in the Chicago metropolitan area. By maintaining a dedicated collection of the most heavily requested periodicals and having access to the collections of all cooperating libraries, the Periodical Bank can provide photocopies of articles on request while reducing the necessity for each library to maintain and access comprehensive collections. The Bank's speed and rate of success in filling requests have been improved by studying requests to identify which periodicals should be in the Bank. A selective union catalog is being developed which will further improve the service and the economy possible through this cooperative arrangement. (KB)

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FINAL REPORT

Project No. L 0109 JA
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Improving the Speed and Comprehensiveness of Interlibrary Access to Periodical Literature

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Associated Colleges of the Midwest
Chicago, Illinois

April 1976

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U.S. DEPARTMENT OF
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ABSTRACT

This project was designed to assist in the development of an interlibrary periodical photocopying service based on a dedicated collection of heavily used titles and a centrally directed procedure for making photocopies at cooperating libraries in the Chicago area from periodicals not in the dedicated collection.

Analyses of requests for periodical article photocopies supported adjustments in subscriptions and backfile holdings of the dedicated collection, revealed deficiencies in the periodical resources of the original list of cooperating libraries, and provided information needed for locating and appraising the potential usefulness of possible additions to the list.

An essential tool is a selective union list that is being developed covering the holdings of the Periodical Bank and the cooperating libraries of all titles for which the Bank has had requests.

The project has improved the speed and comprehensiveness of Periodical Bank service; the latter demonstrated by an increase in the fill rate from 79.2 to 91.4 percent. The experience and studies made suggest the possibility of regional or national services containing dedicated collections of heavily used titles and using the periodical resources of the libraries to be found in a major metropolitan area for less frequently requested titles.

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1. INTRODUCTION

Libraries of all kinds are faced with great and constantly increasing problems as they endeavor to satisfy their readers' demand for access to periodical literature. The number of periodicals is so great and subscription costs are increasing so dramatically that all libraries, including even the most affluent, find it increasingly difficult to provide their readers with direct access to all the periodical literature they want. The result is that cooperative arrangements of several different types are being developed by which librarians hope to provide their readers with better service at acceptable cost levels. The Periodical Bank of the Associated Colleges of the Midwest is one of these cooperative arrangements. It has, however, some distinctive features.

Traditional interlibrary loan procedures have not provided a completely satisfactory supplement to on-site periodical collections. Searches for appropriate sources and verification of holdings are burdensome. The borrowing process has frequently been slow, and the proportion of requests filled has generally been low. The burden on libraries with strong periodical collections has also frequently been inequitable, and such service is often denied to undergraduate readers.

The ACM Periodical Bank is a supplementary service that is less onerous, more comprehensive, and faster than typical interlibrary procedures. To achieve comprehensiveness, arrangements have been made to have access to the periodical collections of major libraries in the Chicago Metropolitan Area. These libraries include: The Chicago Public Library, The John Crerar Library, The Newberry Library, The Northwestern University Library, The University of Chicago Library, University of Illinois Libraries at Chicago Circle and the Medical Center, The Central Serials Service of the North Suburban Library System, and several small specialized libraries. As no union list of the holdings of these libraries exists, it has been suggested that persons wishing to use the service of the Periodical Bank dispense with the effort to determine through searches in the Union List of Serials and similar bibliographic sources whether a desired periodical is available at one of these libraries. This fact and the use of the service by undergraduates and the general public, as well as by scholars, has undoubtedly resulted in errors in citations which have not been identified as such. As a consequence, failures have been recorded when the article as cited did not exist. In spite of the absence of the verification requirement, however, the record of the Periodical Bank in filling requests has been quite good.

Failure to fill requests for copies of periodical articles arises from two sources: the periodical requested is not owned by the Periodical Bank or any of the cooperating libraries, or it is owned by one or more libraries but the issue needed is not available.

Lack of availability may be due to incomplete files, to issues misplaced or at the bindery, to mutilation, or to the fact that the needed issue is being used by a library patron. These last two causes are most likely to occur for periodicals for which there are heavy demands. Success in filling requests for these periodicals is, therefore, considerably increased by the use of a collection of such titles, dedicated exclusively to the interlibrary function. The Periodical Bank contains such a collection, the composition of which has been empirically determined by the number of requests that the Bank has received for the titles acquired. Because the demand for access to periodicals is heavily concentrated on relatively few titles, the size of this collection is relatively small, including less than two thousand titles.

Much of the dedicated collection is in microform. Because this collection is small, compact, and is used solely for filling requests for photocopies, it makes possible rapid and efficient response to requests for photocopies from the frequently requested periodicals. Reliance on the cooperating libraries can thus be confined to relatively infrequently requested periodicals. In the effort to keep the burden on cooperating libraries as light as possible, the retrieving of the issues needed and photocopying at these libraries is done by Periodical Bank employees.[1]

The grant was requested to enable the Periodical Bank to take a number of steps designed to improve the speed and comprehensiveness of the service it renders. Studies were made of the numbers of requests received for each periodical, and of Periodical Bank success in filling these requests, including the identity of the library at which each request was filled. These studies have identified the heavily used periodicals that should be in the Periodical Bank dedicated collection and were also designed to identify collections that could be usefully added to the list of cooperating libraries.

The major device for improving the speed of service has been the development of the selective union list of periodicals held by the Periodical Bank and cooperating libraries. This list was designed to show all the holdings of the Periodical Bank and the smaller cooperating libraries and the holdings of the larger libraries of all titles for which photocopies have been requested from the Periodical Bank since its inception. In addition each request is stamped with date of receipt and with the date the request was filled or the requesting library was notified that the Bank was unable to fill the request. This information was designed to make possible studies of speed of

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[1] An exception to this rule is the Central Serials Service of the North Suburban Library System (CSS). The Periodical Bank has reciprocal arrangements with CSS under which the Periodical Bank and CSS produce photocopies for each other in response to requests transmitted by teletype.

service, and to make possible current monitoring of the efficiency of procedures and staff.

2. THE SELECTIVE UNION LIST

A major task that the Periodical Bank has faced ever since it began to make use of the cooperating libraries has been to develop effective procedures for routing requests to cooperating libraries in a sequence that would assure that requests would be filled as promptly as possible. An up-to-date union list of the holdings of all the cooperating libraries would be of great assistance in this process. Such a union list does not exist. In fact no periodical holdings lists at all are available for the University of Chicago Libraries and the Newberry Library; and the latest information available in published form on the holdings of the John Crerar Library was issued in 1965. Even if complete current holdings lists were available for each of the cooperating libraries, the routing of requests would be extremely slow without some means of integrating in a single list the information with respect to the holdings of each periodical requested. The process of integrating such information has been a major activity under the Office of Education Grant, and it therefore seems desirable to describe it in some detail.

The process started with a computer generated listing of titles and call numbers for all periodicals held by the Periodical Bank or for which requests had been received by the Bank up to June 30, 1974. This list was printed with wide spaces between titles to accommodate substantial interlinear entries. Additional entries were made by hand on the list as follows;

1. The complete periodical holdings of three small libraries were added to the list. These libraries were the Central Serials Service of the North Suburban Library System, Garrett Theological Seminary and Seabury-Western Theological Seminary.
2. The holdings of major cooperating libraries were searched for every title on the computer generated list, and information on their holdings of these titles were entered by hand on the list. The libraries for which this has been done are: The John Crerar Library, The Newberry Library, and the Library of the Health Sciences at the University of Illinois Health Center.
3. As requests are filled, whether for periodicals already on the list or for new titles, and it is necessary to search for the periodicals at cooperating libraries, holdings information is added to the list. In this manner much information on the holdings of the University of Chicago and Northwestern University have been added for already listed titles, and for all libraries for periodicals being requested for the first time.

By these procedures it has been possible to produce a "Selective Union List" of all periodicals owned by the Bank, or that have been

requested from the Bank. As of April 1, 1976, this list contained approximately 11,500 titles. The list is selective in the sense that it contains only those titles that are held by the Bank or that have been requested from the Bank. It is a union list to the extent that the holdings of these titles by cooperating libraries have been entered on the list. Its greatest deficiency is that the holdings of the University of Chicago and Northwestern University Libraries have not been checked for every item on the list. These sources have been entered in many instances as requests have come in, but the major inadequacies in the Selective Union List as it now stands are the gaps in information on the holdings of these two important cooperating libraries.

The Selective Union List differs from standard union lists in one other respect. Because it is incomplete, it is not possible to assume that the lack of an entry for a given library means that the title is not held by that library. When an unsuccessful search is made for a title at one of the cooperating libraries, therefore, an entry is made on the Selective Union List to indicate the absence of the title in the Library's holdings.

A projected activity for the summer of 1976 is the conversion of the information that has been written on the present Selective Union List to machine readable form and the production of a new Selective Union List on which all holdings information accumulated to the present time will be printed.

3. OPERATING PROCEDURES

The process of filling requests begins with date stamping and recording receipt of requests and sorting them into those that can be filled from the Periodical Bank collection and those for which it is necessary to turn to one of the cooperating libraries. For the former there are two rhythms each day. Photocopies in response to requests that have been received by 8:30 a.m. that can be filled from the Periodical Bank collection are mailed at noon. For similar requests received by noon, the photocopies are mailed at the end of the working day.

The first step in processing requests that cannot be filled from the Bank collection is to consult the Selective List. If the list shows one or more cooperating libraries at which the request might be filled, the libraries and call numbers are entered on the reverse side of the request. If the list indicates that the title is not available at one or more of the cooperating libraries, this information is also shown. If the Selective List does not show a cooperating library holding the title and issue needed, available holdings lists of libraries for which information has not been entered on the Selective Union List are searched. If none of these show the title, and the periodical needed seems within its scope, the title

will be searched in the Newberry catalog. If it is not at the Newberry, it will be sent to the University of Chicago, or to the John Crerar (for which the available holdings list is sadly out of date).

In the process of filling requests at cooperating libraries requests are dispatched to cooperating libraries each morning, and photocopies received from cooperating libraries are mailed at the close of the working day. Where the Selective Union List shows that the request can probably be filled at the Central Serials Service of the North Suburban Library System, the request is forwarded by teletype. Requests to Northwestern University are sent by a cooperative messenger service operated by the Illinois Regional Library Council. The Central Serials Service and the Periodical Bank employee at Northwestern University mail the photocopies they produce directly to the requesting libraries.

A great majority of the requests not filled from the Bank's own collection are filled at the cooperating libraries to which the requests are taken each morning, and from which photocopies are brought each afternoon. Part time employees of the Bank at the John Crerar Library, the University of Illinois -- Chicago Circle Library, and the University of Chicago Libraries fill requests at these institutions, and the person in charge of this "outside service" aspect of the Bank's operations fills requests at the University of Illinois -- Library of the Health Sciences and at Rush Medical School. If a request cannot be filled at the first library shown as holding the title, it is passed on to the next library on the list, until it is filled, or it is determined that it cannot be filled. Notification of reasons for failure to fill requests is sent to requesting libraries by use of two symbols: "N", owned by one or more of our sources, but the issue desired is not available, or "U", the title is unavailable at any of our sources.

The fate of every request received (except for those that are cancelled before being filled) is recorded in machine readable form. The data recorded include: the identity of the requesting library, the ILLRQ number, the periodical, the year of publication, the number of exposures, the library where the request was filled, or where the title is held but the issue needed was not available, the date of receipt of the request and the date the photcopy was mailed, or information on inability to fill the request was transmitted to the requesting library. These data provide the information needed for monthly billings and for the analyses of Periodical Bank performance that have been made under the grant.

4. THE COOPERATING LIBRARIES

One of the important activities under the grant has been the study of failures to fill requests and the examination of the holdings of Chicago area libraries to discover sources which would make it

possible to increase the proportion of requests filled. As a result of these inquiries, the following libraries have been added to the list of cooperating libraries: The University of Illinois -- Library of the Health Sciences at the Medical Center, The Rush Medical School Library, The Chicago Public Library, The Garrett Theological School Library, and the Seabury-Western Theological School Library.

The importance of the Cooperating Libraries in Periodical Bank operations has increased greatly in recent years. In the first year in which cooperating libraries were used (July 1969-June 1970) only 833 of the 12,584 requests -- or 6.7 percent -- were filled at Cooperating Libraries. By 1974-1975 the number so filled had increased to 12,081 out of 25,507 or 47.4 percent.

5. SERVICE TO ASSOCIATE MEMBERS

Originally the Periodical Bank served only 10 relatively small liberal arts colleges that created it, and was supported by rather heavy annual assessments on these colleges. It was able to build a very useful collection from the contributions in kind of the original members and with the aid of substantial grants from the Office of Education and the National Science Foundation. It soon became apparent that the collection and the organization were capable of serving a much wider clientele, and expansion of the number of libraries served promised substantial reductions in cost per request filled. As a consequence, it was decided to offer associate memberships to academic and other libraries. The first associate members joined the Bank in 1971, and by April, 1976 the number of associate members totalled 84, including not only academic libraries, but public libraries and library systems, library consortia, and corporate libraries. The list of associate members in early 1976 is given in Appendix A to this report.

The addition of associate members resulted in a substantial increase in the number of requests received. The number of requests filled rose from 16,139 in 1970-71 to 25,507 in 1974-75. The proportion of the total number of requests filled that have been for associate members has risen from a modest 10.8 percent in the first year that they participated in the Periodical Bank, 1971-72, to 65.5 percent in 1974-75. Since the potential for growth is almost wholly confined to growth in associate member use of the Bank, this proportion may be expected to continue to increase; as indeed it has. In the first six months of the 1975-76 fiscal year it had risen to 70.5 percent.

6. COMPREHENSIVENESS OF SERVICE

A central objective under the grant has been to increase the comprehensiveness of the service rendered. The measure of comprehensiveness used has been the proportion of the requests received that the Periodical Bank has been able to fill. In the period covered by the grant this proportion has increased substantially. For the three half-year periods the proportion of all requests received that have been filled has been:

July-December, 1974	79.2%
January-June, 1975	87.5%
July-December, 1975	91.4%

Although these results show that there has been a definite increase in the proportion of requests filled, and that the results in the final half-year were close to the maximum that can be hoped for when verification of holdings in advance is not required, it should not be expected to continue indefinitely. In the strictest sense these percentage figures are not entirely comparable. The composition of the requests received was not necessarily comparable from one period to another. Associate members may join the Bank for a trial period, for example, and submit requests for very rare periodicals that they have been unable to locate after wide searching in bibliographic sources. If the Bank is unable to fill a significant number of these requests, the prospective member may decide not to join the Bank. Consortia and other libraries that have access to other periodical services have joined the Bank to obtain back-up service for other interlibrary periodical access arrangements. An increase in the proportion of requests coming from such associate members clearly tends to reduce the Periodical Bank performance record.

Changing composition of the associate membership in terms of the type of library served can also change the Bank's performance record. Table 1 shows that there are differences in the proportions of requests that the Bank has been able to fill for different types of libraries. The data apply to the 18 month period ending with December, 1975. They indicate that, except for the small number of requests from commercial and industrial libraries, the Bank has been most successful in filling requests from libraries at undergraduate institutions. The proportion of all requests received that came from strictly undergraduate institutions was 48.3 percent. When we add institutions providing no instruction beyond the master's degree--institutions that almost without exception are predominantly undergraduate--the percentage rises to 71.9 percent. These data suggest that if in the future the proportions of requests received from other types of libraries increase, the performance record of the Bank will probably decline.

There has been one other aspect of the success in filling requests to which the grant has contributed. This is the extent

TABLE 1

Percentage of Requests Filled and Unfilled
by Type of Requesting Library

July 1, 1974 - December 31, 1975

Type of Library	Number of Requests Filled	Unfilled	Total	Percent	Percent filled
Two years but less than four	2,173	275	2,448	6.0	88.8
Four or five years baccalaureate	15,212	1,938	17,150	42.3	88.7
Masters	8,192	1,368	9,560	23.6	85.7
Masters plus but less than doctorate	2,841	735	3,576	8.8	79.4
Doctorate	3,033	653	3,686	9.1	82.3
Public Libraries and Systems	1,949	490	2,439	6.0	79.9
Commercial and Industrial	335	35	370	0.9	90.5
Unclassified	1,028	294	1,322	3.3	77.8
TOTAL	34,763	5,788	40,551	100.0	85.7

to which the Bank has been successful in filling requests for periodicals on its own list of holdings. The data compiled under the grant show the number of requests received for each title and the year of publication of the article requested. This information has made it possible for the Bank to use money received under an Office of Education Title II-A grant to fill in gaps in backfiles and to enter new subscriptions for titles shown to be heavily used.

The additional cooperating libraries have also contributed to the Bank's success in filling requests for photocopies from titles in its holdings, but for issues that it does not have. The combined results of judicious improvement of its own holdings and the acquisition of new cooperating libraries made it possible to fill the following percentages of all requests for photocopies from periodicals on the Bank's holdings list:

July-December, 1974	93.3 %
January-June, 1975	96.0 %
July-December, 1975	99.2 %

7. SPEED OF SERVICE

In addition to improving the performance record of the Bank in terms of the proportion of requests filled, the grant was designed to reduce the time elapsing between the receipt of a request and the mailing of the photocopy. The same day procedure that the Bank has developed for items in its own holdings has been in successful operation for the last year. It represents an optimum turn around time, which is achievable for these requests only.

The Selective Union List has made a major contribution to speed in filling requests for items not on the Periodical Bank's holdings list. It results in more efficient routing of requests and makes it unnecessary to consult card catalogs in searching for periodicals for which full information has been entered on the list. To those who are engaged in filling "outside" requests it is obvious that the process has become more efficient in recent months, but also that there is much more that could be done to speed up the filling of requests at cooperating libraries. Considerable additional information needs to be added to the list, particularly on the holdings of the University of Chicago and Northwestern University. During the summer of 1976 a new selective list will be produced on which all the data added by hand on the old list will be printed. Thus a new cycle of entering information on the list can be started.

Unfortunately it is not possible at this time to provide quantitative verification of the improvement in speed of service. The date of receipt of each request, and of mailing the photocopy have been currently entered in the computer since July 1, 1974. Technical problems, however, have been encountered in the effort

to obtain the necessary tabulations from the computer. It is hoped that these difficulties can be overcome in the next few months.

8. DISSEMINATION OF RESULTS

Three papers have been produced under the grant. The first was entitled, "The Optimum Size for Periodical Collections in Liberal Arts College Libraries", and was presented at a conference on "Space, Growth and Performance Problems of College and University Libraries", sponsored by the Associated Colleges of the Midwest, and held on April 17-19, 1975. The proceedings of this conference were published by Greenwood Press in early 1976, under the title: Farewell to Alexandria: Solutions to Space, Growth, and Performance Problems of Libraries.

The second was an article entitled, "Periodicals and the Liberal Arts College Library". It appeared in College and Research Libraries for September, 1975.

The third is a paper entitled, "The Costs of Providing Access to Periodical Literature in Academic Libraries". It was presented to the University and Seminary Library Section of the Catholic Library Association on April 19, 1976. It will be published in a forthcoming issue of Catholic Library World.

Work under the grant has resulted in ideas with respect to the provision of access to periodical literature that have not been widely held in library circles. These ideas are described in the concluding sections of this report. They are currently being discussed by librarians in the Chicago area, and wider dissemination is expected in the future.

9. IMPLICATIONS OF FINDINGS

The pattern of heavy use of a relatively small number of periodicals and infrequent use of a very large number of titles is well known. The implications of this pattern in terms of the cost of providing access to periodical literature, however, seem to be very generally overlooked in proposals for improving such access, or for providing it at more reasonable cost. A program such as that of the British Library Lending Division, which aspires to comprehensiveness of coverage would be an efficient answer to the problem of high cost for infrequently used periodicals if it enabled the libraries using the service to eliminate their holdings of such titles. Anyone familiar with the characteristic environment of libraries, especially academic libraries, will realize that such reduction in holdings will be grudging and minor in terms of the magnitude of such holdings. The establishment of a comprehensive collection dedicated to inter-

library periodical access in a city like Chicago, for example, would mean that hundreds of thousands of dollars would be spent every year in the acquisition of periodicals that are used very infrequently, and that are also held by one or more libraries in the Chicago area. It should not be difficult to design interlibrary procedures that would make these infrequently used periodicals promptly available to other libraries at minimum inconvenience to the libraries owning them.

There is need for a collection dedicated to interlibrary use containing titles not otherwise available. There is also need for a dedicated collection of titles that are heavily used. Efforts to obtain access to these periodicals are frequently frustrated in several different ways. They may already be in use, and they have the highest incidence of misshelving and mutilation. The fact that a dedicated collection of heavily used periodicals is needed is demonstrated by the experience of the British Library Lending Division, where Lancet was reported to be the most frequently requested title, and on a much more modest scale by the Periodical Bank. A study of the number of requests made in three years by ACM libraries related to the number of these libraries holding the title revealed that by far the largest number of requests (78.4 per title) were for periodicals held by all ten libraries. There were only 12.4 requests per title for periodicals owned by only one of the member libraries and 3.4 requests per title for periodicals not held by any of the member libraries.

The cost implications of such a use distribution are shown in Table 2 which shows the pattern of the requests that member libraries sent to the Periodical Bank during the first three years of its existence, and presents hypothetical costs per request based on an assumed cost of building and maintaining a periodical collection that would have made it possible to fill all these requests, but would contain no titles not requested in the three year period.

A periodical use pattern undoubtedly reflects the nature of the library and its readers. The pattern presented in Table 2 reflects the needs of students and faculty members at ten relatively small liberal arts colleges for periodical articles not available in the college libraries. As was shown above, there is a positive relationship between use of the Periodical Bank for access to a periodical and the number of member libraries holding the title. This supports the presumption that the Periodical Bank pattern is similar to the pattern on the individual campus, but the proportion of heavily used titles may actually be somewhat less than for the individual libraries, because so many of these periodicals are also available on campus.

It may be seen from Table 2 that the hundred most heavily used periodicals accounted for 40.2 percent of the requests to the Periodical Bank. In fact the first 400 titles accounted for 72.3 percent of all

TABLE 2

Distribution of Requests Received by the Periodical Bank, 1969-1972, and Estimated Cost per Request* of Maintaining A Collection Capable of Filling all Requests

Rank of Periodicals	Number of Titles	Range of Requests per Title (3 years)	Aver. No. of Requests per Title per year	Percent of Requests	Percent of Titles	Average Cost per Request
1-100	100	86-642	58.6	40.2	3.4	$ 0.85
101-200	100	50-86	22.0	15.1	3.4	2.27
201-300	100	37-49	14.4	9.9	3.4	3.47
301-400	100	27-37	10.3	7.1	3.4	4.85
401-500	100	21-27	7.9	5.5	3.4	6.33
501-600	100	17-20	6.2	4.2	3.4	8.06
601-700	100	13-17	4.9	3.4	3.4	10.20
701-800	100	10-13	3.7	2.5	3.4	13.51
801-900	100	7-10	2.8	2.0	3.4	17.86
901-1032	132	6-7	2.1	1.9	4.5	23.81
1033-1277	245	4-5	1.5	2.4	8.2	33.33
1278-1494	217	3	1.0	1.5	7.4	50.00
1495-1909	415	2	0.7	1.9	14.1	75.00
1910-2947	1,038	1	0.3	2.4	35.2	150.00
TOTAL	2,947	-	4.9	100.0	100.0	$ 10.11

* Based on an annual estimated cost of $50 per title per year.

the requests received. The data in Table 2 are based on 43,713 requests for periodical article photocopies in three years. For this volume the estimated average cost per request of acquiring, processing and storing each periodical is shown in the right hand column. The average cost per request goes up very sharply as the number of requests per year goes down and the cost per request becomes very high for periodicals that are infrequently consulted.

Another significant implication emerges from the study of the use the member libraries made of the Periodical Bank in the first three years. During that period these ten college libraries sent 43,713 requests to the Periodical Bank from 2,947 periodicals. Only 1,311 of these titles were owned by one or more of the member libraries. But they held a total of 4,106 different periodicals. They therefore held many periodicals that were consulted very infrequently or not at all, and consequently at very high costs per use: costs, in fact, very much higher than would have been incurred if these periodicals had not been held, but the Periodical Bank had been used to obtain access to them.

The data presented above relate to the experience of the Periodical Bank in serving the ten liberal arts colleges that created it. Extrapolation of the conclusions from this experience to a service with a much wider clientele may be tentatively made by adding to the study data for two years during which the Bank served a much wider clientele, including university libraries, public libraries and library systems, and specialized libraries. The added data also permit some conclusions about the costs of creating and operating a comprehensive interlibrary periodical service.

Changes in the nature of the demand for Periodical Bank services as a result of its more inclusive membership may be explored by means of the data shown in Tables 3 and 4. These tables show the distributions of periodicals ranked in order of the number of requests received in the three years when the Bank was serving the original member libraries almost exclusively, and in the five years which included two years of service to a much more varied list of libraries. Table 3 is derived from the same data as Table 2, but provides more detailed information.

During the five year period a total of 88,679 requests were received, slightly more than double the 43,713 requests received in the first three years. The number of different titles requested, however, increased from 2,947 to 7,582, or by 2.6 times. The extent to which this contrast is due to the broader membership, or the longer time period covered, is not immediately apparent. An increase over time in the total number of titles requested would occur even if the libraries served were unchanged. For purposes of extrapolation, however, it is useful to include both broader membership and a longer time period, since our interest is in the nature of a service needed by a broader clientele over an indefinite period of time. In this sense, the comparison of the two distributions gives us some idea of what might be expected from a comprehensive service.

TABLE 3

Distribution of Requests Received by the ACM Periodical Bank
From September 1, 1969 to June 30, 1972
In Order of Number of Requests per Title

1 Rank of Periodicals	2 No. of Titles in Class	3 Cumulative % of Titles (Percent)	4 Range of Requests per Title	5 Number of Requests	6 Percentage of Requests	7 Cumulative % of Requests	8 Ave. No. of Requests per Title per Year	9 Estimated (1) Acquisition Cost	10 Average Cost per Request
1-50	50	1.7	144-642	11,999	27.4	27.4	80.0	$ 7,500	$ 0.62
51-100	50	3.4	86-142	5,578	12.8	40.2	37.2	7,500	1.34
101-150	50	5.1	67-86	3,742	8.6	48.8	24.9	7,500	2.00
151-200	50	6.8	50-67	2,867	6.5	55.3	19.1	7,500	2.62
201-250	50	8.5	44-49	2,310	5.3	60.6	15.4	7,500	3.25
251-300	50	10.2	37-43	2,005	4.6	65.2	13.4	7,500	3.74
301-350	50	11.9	31-37	1,674	3.8	69.0	11.2	7,500	4.48
351-400	50	13.6	27-31	1,429	3.3	72.3	9.5	7,500	5.25
401-450	50	15.3	24-27	1,266	2.9	75.2	8.4	7,500	5.92
451-500	50	17.0	21-24	1,119	2.6	77.8	7.5	7,500	6.70
501-550	50	18.7	19-20	977	2.2	80.0	6.5	7,500	7.68
551-600	50	20.4	17-19	884	2.0	82.0	5.9	7,500	8.48
601-650	50	22.1	16-17	784	1.8	83.8	5.2	7,500	9.57
651-700	50	23.8	13-15	690	1.6	85.4	4.6	7,500	10.87
701-750	50	25.5	11-13	583	1.3	86.7	3.9	7,500	12.86
751-800	50	27.2	10-11	517	1.2	87.9	3.4	7,500	14.51
801-850	50	28.9	9-10	464	1.1	89.0	3.1	7,500	16.16
851-900	50	30.6	7-9	402	0.9	89.9	2.7	7,500	18.66
901-950	50	32.3	6-7	342	0.8	90.7	2.3	7,500	21.93
951-1032	82	35.1	6	492	1.1	91.8	2.0	12,300	25.00
1033-1122	90	38.1	5	450	1.0	92.8	1.7	13,500	30.00
1123-1277	155	43.3	4	620	1.4	94.2	1.3	23,250	37.50
1278-1494	217	50.7	3	651	1.5	95.7	1.0	32,550	50.00
1495-1909	415	64.8	2	830	1.9	97.6	0.7	62,250	75.00
1910-2947	1,038	100.0	1	1,038	2.4	100.0	0.3	155,700	150.00
TOTALS	2,947			43,713				$442,050	$ 10.11

(1) At $50 per title per year.

TABLE 4

DISTRIBUTION OF TITLES AND REQUESTS FOR PERIODICAL ARTICLE PHOTOCOPIES RECEIVED BY THE ACM PERIODICAL BANK, SEPTEMBER 1, 1969 to JUNE 30, 1974

RANK OF PERIOD-ICAL	RANGE OF REQUESTS	TITLES			REQUESTS			ACQUISITION COST	COST PER REQUEST
		NO.	%	CUMU-LATED %	NO.	%	CUMU-LATED	COST $	$
1-50	211-785	50	0.66	0.66	17,156	19.35	19.35	12,500	0.73
51-100	140-209	50	0.66	1.32	8,557	9.65	29.00	12,500	1.46
101-150	110-140	50	0.66	1.98	6,068	6.84	35.84	12,500	2.06
151-200	90-109	50	0.66	2.64	4,979	5.61	41.45	12,500	2.51
201-250	77-90	50	0.66	3.30	4,178	4.71	46.15	12,500	2.99
251-300	67-77	50	0.66	3.96	3,657	4.12	50.28	12,500	3.42
301-350	60-67	50	0.66	4.62	3,180	3.59	53.87	12,500	3.93
351-400	52-60	50	0.66	5.28	2,749	3.10	56.97	12,500	4.55
401-450	47-52	50	0.66	5.94	2,478	2.79	59.76	12,500	5.04
451-500	42-47	50	0.66	6.60	2,248	2.54	62.30	12,500	5.56
501-550	38-42	50	0.66	7.26	1,998	2.25	64.55	12,500	6.26
551-600	34-38	50	0.66	7.92	1,186	2.05	66.60	12,500	6.88
601-650	31-34	50	0.66	8.58	1,636	1.85	68.45	12,500	7.64
651-700	28-31	50	0.66	9.24	1,485	1.67	70.12	12,500	8.41
701-750	26-28	50	0.66	9.90	1,359	1.53	71.65	12,500	9.20
751-800	24-26	50	0.66	10.56	1,249	1.41	73.06	12,500	10.01
801-850	21-24	50	0.66	11.22	1,125	1.27	74.33	12,500	11.11
851-900	19-21	50	0.66	11.88	1,089	1.23	75.56	12,500	11.48
901-950	18-19	50	0.66	12.54	918	1.04	76.60	12,500	13.62
951-1016	17-18	66	0.87	13.41	1,127	1.27	77.87	16,500	14.64
1017-1073	16	57	0.75	14.16	912	1.03	78.90	14,250	15.62
1074-1104	15	31	0.41	14.57	465	0.52	79.42	7,750	16.67
1105-1148	14	44	0.58	15.15	616	0.69	80.11	11,000	17.86
1149-1189	13	41	0.54	15.69	533	0.60	80.71	10,250	19.23
1190-1257	12	68	0.89	16.58	816	0.92	81.63	17,000	20.83
1258-1327	11	70	0.92	17.50	770	0.87	82.52	17,500	22.73
1328-1412	10	85	1.12	18.62	850	0.96	83.46	21,250	25.00
1413-1511	9	99	1.30	19.92	891	1.00	84.46	24,750	27.78
1512-1643	8	132	1.74	21.66	1,056	1.19	85.65	33.000	31.25
1644-1786	7	143	1.88	23.54	1,001	1.13	86.78	35,750	35.71
1787-1982	6	196	2.58	26.12	1,176	1.33	88.11	49,000	41.67
1983-2252	5	270	3.55	29.67	1,350	1.52	89.63	67,500	50.00
2253-2649	4	397	5.23	34.90	1,588	1.79	91.42	99,250	62.50
2650-3494	3	845	11.13	46.03	2,535	2.86	94.28	211,250	83.33
3495-4464	2	970	12.77	58.80	1,940	2.19	96.47	242,500	125.00
4465-7592	1	3,128	41.20	100.00	3,128	3.53	100.00	782,000	250.00
TOTAL		7,582	100.00		88,679	100.00		1,898,000	21.40

In the shorter period the heavy demand was clearly concentrated on a smaller number of titles. The 50 most heavily requested titles received 27.4 percent of the requests. In the longer period the 50 leading periodicals received only 19.35 percent of the requests. A total of 350 periodicals filled 69 percent of the requests made in three years, while in the five year period it took 650 titles to fill 68.45 percent of the requests. Another illustration is found by trying to answer the question of the size of the collection that would be needed to fill approximately 75 percent of the requests received. This could have been done for the earlier period and clientele with 459 titles (75.2%). But with a broader clientele and over a longer time period it required 900 titles to fill 75.56 percent of the requests. In this case doubling the number of requests required a doubling of the number of titles. Does this suggest that a comprehensive service covering, say 75,820 titles, would require a proportionate increase in the number of titles needed in a central collection designed to fill 75 percent of the requests received? If so, the central collection would need 9,000 titles, since the hypothetical total number of titles is ten times the number shown in Table 4. Such a proportionate increase, however, seems unrealistic. It is reasonable to expect that as the service becomes more comprehensive, there will be a greater concentration of use on the heavily used titles. In the shorter period, for example the 75.2 percent coverage required 15.3 percent of the titles requested. For the five year time span 11.88 percent of the titles filled 75.6 percent of the requests. It is clear that the breadth of the service and the time period covered by the data accumulated so far are inadequate for reasonable projections as to the size of a central collection that would be needed to fill a given percentage of the requests received.

Another way of looking at the changes at the heavy use end of the distribution that resulted from the broadened clientele is to consider what happened to the composition of the list of the 50 most heavily used titles. There were, of course, numerous changes in the rank order of individual periodicals, but 44 of the titles on the original list were still in the highest use 50 on the second list. The titles that rose to this category and those that dropped out are shown in Table 5. It is not possible to discover a clear pattern in these shifts in rank, nor to draw significant conclusions from the facts that the periodicals added to the list gained on the average slightly less than 11 steps, while those that fell from the list went down, on the average, more than 24 steps.

When attention is turned to the infrequently requested periodicals, a number of significant facts emerge. The titles that were requested two times or less per year -- six requests or less in three years:

TABLE 5

Changes in Titles Included in the Lists of Fiftly Most Heavily Used Periodicals:

1969-1972 Compared With 1969-1974

Periodicals added to the top 50

	Ranks 1969-72	1969-74
Journal of Neurophysiology	52	37
School and Society	54	40
Journal of American Folklore	60	44
Journal of Physiology	56	46
Commonweal	55	48
Child Development	51	49

Periodicals dropped from the top 50

	Ranks 1969-72	1969-74
Biochemistry (American Medical Society)	29	52
Journal of General Physiology	35	61
Economic History Review	36	59
American Psychologist	42	51
Hispania	46	79
Journal of Personality	49	81

ten requests or less in five years -- constituted between 64.9 percent and 67.7 percent, respectively, of all the titles requested in the shorter period[1] and 82.5 percent of all the titles for the longer period.[2] It is particularly striking that the largest number of titles are found in the least frequently requested categories in both distributions. It may be seen from Table 3 that there were 1,038 titles, or 35.2 percent of all titles requested, that were requested only once in three years. Table 4 shows 3,128 titles, or 41.2 percent of the total, that were requested only once in five years. It may confidently be expected that as the length of time covered lengthens, the proportion of titles requested only once will continue to increase.

The cost implications of this pattern of use are shown in the two columns on the right of Tables 3 and 4. These cost figures are based on the arbitrary assumption of an average cost of $50 per title per year for acquiring and storing a periodical. If another average figure seems more appropriate, the estimates may be corrected by making proportionate adjustments in the cost per use figures. The $50 assumption leads to an estimated cost per request of $150 for titles requested once in three years (Table 3), and of $250 per request for titles requested only once in five years (Table 4). Because of the constant multiplier of $50, the cumulative percentages of titles and requests also show the proportions of total costs incurred in acquiring and holding the numbers of periodicals shown. Thus the periodicals requested only once in three years absorbed 35.2 percent of such costs in the shorter period, and those requested only once in five years accounted for 41.2 percent of the costs for the full period covered. The percentages given above for periodicals requested two times or less per year are also applicable to the cost situation. Thus in the earlier period these periodicals would have absorbed between 64.9 and 67.7 percent of total acquisition and holdings costs, or between $286,890 and $299,268, out of total costs of $442,050. For the five year period the costs of acquiring and holding the titles requested on the average twice a year would be $1,565,850, or 82.5 percent of the $1,898,000 total cost.

But even these figures understate the burden of acquiring and holding the less frequently requested titles in a comprehensive list over an indefinite number of years. They take no account of the titles that would be included in a comprehensive collection that were not requested once in the limited experience described here. As time goes on more and more of these titles will be requested, but at higher and higher costs per use.

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1. See the cumulated percentage of titles column of Table 3. The percentages given were obtained by subtracting 35.1 and 32.3 respectively from 100.

2. See the cumulated percentage of titles column of Table 4. This percentage was obtained by subtracting 17.5 from 100.

Objections may be raised to the above conclusions on the grounds that they relate to only 88,679 requests received over a five year period, while a national service could well involve millions of requests per year. This objection is well taken as it relates to the average number of requests per year. Thus a great expansion in the total number of requests will mean that far more than 1,412 titles will be needed to meet an average of two or more requests per title per year.[1] Such an assumption would ignore the vast majority of all periodicals; those that have not been requested at all from the Periodical Bank in five years. The most reasonable assumption seems to be that in a comprehensive service over an extended period of time, more and more of these titles would be requested, but for most of them the number of requests would be quite small, and the costs per request very high. The cost implications of this situation for a collection of, say, 75,820 titles, are staggering. Not only would such a collection contain thousands of titles for which the cost per use would be very high, but there would be many titles that would not be requested at all over a quite extended period of time.

The immediate need is a more extensive base of experience with a program involving a dedicated collection of heavily used periodicals and the development of effective and rapid procedures for filling requests for other periodicals. The data on use collected so far suggest that an effective national periodical access service might be created by establishing three categories of periodicals:

1. Heavily used periodicals which should be held in a central collection dedicated to the provision of interlibrary access to these periodicals.
2. Less heavily used periodicals which are requested so infrequently that the cost per use of holding them in a collection dedicated solely to interlibrary use would result in excessive costs per use. These would be held in libraries desiring to have on-site access to these titles. Such a library could become a designated library for a given periodical, and would receive some compensation for maintaining a complete file of the periodical under conditions that would assure that it would be constantly available to an interlibrary access service.
3. Periodicals for which interlibrary requests are made very infrequently. Many libraries hold such periodicals because of special interests, or for other reasons. A library holding such a periodical would also be a designated library for access to it, but would not be compensated for performing this function, although it would be compensated for the direct costs incurred

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[1] This is the number of titles shown in Table 4 that were required to fill 10 or more requests in five years. See the "Rank of Periodical" column.

in providing access to it. Its compensation for serving as a designated library would be the access it would have to similar periodical archives elsewhere.

Much more information and experimentation is needed to establish such a classification, to discover appropriate sources, and to develop the procedures that would be required for the effective operation of the contemplated service. It seems, however, that such data collection and experimentation would be eminently worth while. Some preliminary steps that might be taken in the direction are briefly described in the concluding section of thisreport.

10. CONCLUSION

The grant has made a major contribution to the Periodical Bank of the Associated Colleges of the Midwest. Substantial progress has been made under it in meeting the objectives contemplated under the grant, namely improving the speed and comprehensiveness of the access to periodical literature provided by the Bank. The process of producing and analyzing the data provided for under the grant has led to conceptions with respect to central periodical services, whether regional or national, that have not so far been given the attention they deserve. These conceptions are set forth in the concluding paragraphs of the paper presented to the Catholic Library Association. This part of that paper read as follows:

"Much would be gained, both in service and costs, if the major libraries in the Chicago area could form a periodical pool consisting of all of their periodical resources. This would be an operational pool, not a physical one. Each library would have its own periodical holdings, but these would not be built and maintained in isolation, but in consultation and cooperation with the other libraries contributing to the pool. New, rapid interlibrary access arrangements would have to be developed so that the resources of the entire pool would be promptly available to any participant.

"The ACM Periodical Bank could play an essential role in such an arrangement. It has developed procedures involving daily dispatch of requests to, and collection of photocopies from, its employees who are responsible for making photocopies at cooperating libraries. It has built a collection of its own of heavily used periodicals, the contents of which have been determined by six years of experience. These are the titles most likely to be in use at the cooperating libraries holding them. An arrangement under which the cooperating libraries are called on only for access to their less frequently used periodicals involves a minimum of inconvenience to their staffs and readers. The small, compact Periodical Bank collection also makes possible rapid and efficient production of photocopies.

"The cooperative arrangement proposed here would make quickly and easily available to readers at all the participating libraries a much wider range of periodical literature than they have ready access to at the present time. It should include procedures for recording transactions so a body of information would be built up indicating the number of requests for each periodical. This information would be of great value in making decisions on which periodicals could be safely dropped by one or more libraries. When we consider the tremendous sums that are now being spent per use on many of these periodicals, the potential savings become immediately apparent.

"It should be emphasized in conclusion that this proposal starts with a union list of holdings, but it is more than a union list. It includes provision for more rapid and efficient interlibrary service for periodical literature, but it is more than more efficient interlibrary service. It is a coordinated program of periodical acquisition and retention activities designed not only to increase significantly the range of periodical literature available to the readers at every participating library, but at the same time to reduce significantly the large sums of money that are now being spent in acquiring and retaining multiple files of rarely used periodicals."